SAC Cereal Recommended List for 2009

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RECOMMENDED

HGCA

SAC cereal recommended list for 2009

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INTRODUCTION

Recommendations are made by SAC and are based on data collected as part of the HGCA Recommended Lists' system. The full data collected and the HGCA Recommended Lists are available on the HGCA website (www.hgca.com): this includes information on varieties not mentioned on the SAC list. Some of the detailed agronomy advice is based on HGCA's RL Plus 'Varieties On Your Farm'; this interactive programme is available on the HGCA website and the CD HGCA Crop Oracle.

To improve the regional application of cereal trials, the UK is divided into several regions. The yields of winter wheat, spring and winter barley, given in the tables are based on trials in the arable east to the north of Durham. For minor crops the yields are UK yields; the spring wheat yields are from spring-sown trials.

A variety is not recommended until it has completed at least three years in trial. If the UK performance indicates a consistent economic benefit over the best existing comparable variety and there are no unacceptable weaknesses, the candidate is given a UK provisional recommendation (P); varieties that do not merit a UK recommendation but have a specific use are given PS. In the tables, fully recommended varieties are listed in order of fungicide treated yield; this is expressed as a percentage of the average treated yield of the control varieties.

A variety may demonstrate advantages or disadvantages under commercial production and marketing that are not evident in field trials. In due course this additional information is included in the notes on varieties. The disease resistance scores indicate the current situation; experience has shown that resistance to mildew and yellow rust may not be maintained.

Assessment of quality is provided by the Malting Barley Committee, the Scotch Whisky Association, the Scottish Flour Millers' Association, the Scottish Oat Millers and others assisting HGCA's Crop Evaluation Committees.

Supplies of multiplication seed (Basic and Certified 1st Generation) may not be generally available; C2 seed stocks of the newer varieties may be limited.

In case of doubt, or for information about varieties not listed, farmers should consult their SAC agricultural advisers or the HGCA website.

CHOICE OF VARIETY

Before choosing a variety consider the following factors and decide which restrict your choice:

- Sale for brewing, distilling or milling (check with your buyer).
- Specific weight.
- Earliness or need to spread the harvest period.
- Ear loss and sprouting risks.
- Disease risk (see below).
- Straw strength and length (barley straw can be of considerable value).

Having eliminated the inappropriate varieties, select from the remainder those with the highest yield potential.

There is a large wheat market for grain whisky production in Scotland. Although some hard wheat may be used, this can cause processing problems so there is a strong preference for **soft** grain of large grain size, low protein content, with good specific weight and low screenings. Ratings for distillery performance range from Good for Istabraq to Poor for all hard wheat varieties and those soft wheat varieties carrying the 1b/1r rye gene translocation; hard wheat varieties and those giving a reduced alcohol yield, or process limitation, are discouraged by distillers. Grain whisky production also uses high enzyme malted barley: sourced from Scotland, Decanter dominates this sector but Maresi is also used. Belgravia and Tartan have been Provisionally Approved and Forensic has potential.

For biscuit-making, soft wheats are preferred. The Hagberg Falling Number should exceed 100, protein should be above 10.7% (on a dry matter basis using the Dumas method) and the gluten must not be damaged by high temperature drying.

There is also demand for bread wheat but only if quality specifications are fully met. Because of our climate, Scottish wheat is generally lower in protein than its English counterpart. In wet harvests the Hagberg Falling Number is so severely reduced that grain is unlikely to meet bread-making requirements.

To assist exports and help foreign millers and bakers recognise the characteristics of UK varieties, HGCA promotes two brands. **uks** covers soft extensible varieties that can be used for biscuit-making or blended into a bread-making flour. **ukp** covers semi-hard varieties that suit both EU and non-EU bread-making.

The intervention market for wheat is restricted to common wheat; Cordiale, Einstein, and Solstice are eligible for intervention.

Quality requirements are becoming more precise especially as characters affecting processing are taken into account. In the malting barley market some varieties are acceptable for distilling but not for brewing. Some varieties are inclined to dormancy, this can prejudice their use by maltsters. Others are prone to splitting, skinning or pre-germination; these conditions may lead to rejection by maltsters. The IBD Approval system (formerly IoB Approval system) is based on malt use with separate Approval lists for brewing and distilling (see tables). As part of product protection, the Scotch Whisky Association will not support varieties which produce GN levels significantly above Optic; the distilling industry's long term requirements will be for GN 'non-producing' varieties such as Belgravia, Concerto, Decanter, Forensic, Oxbridge and Tartan. An asterisk carries Approval based on a minimum number of satisfactory commercial scale tests. (*1) is Provisional Approval based on satisfactory micro-malting or lab results; a variety is moved to Stage 2 Provisional Approval (*2) if the initial commercial scale tests are satisfactory.

There is some demand for winter malting barley but in practice only a small proportion of the Scottish crop meets the grain nitrogen and other specifications and none is used in the

production of malt whisky. The Malting Barley Committee will grant (IBD) brewing Approval for winter barley grown in Scotland, Pearl and Cassata are the only currently Approved varieties.

About 80% of the oats that are sold go for milling. To meet this market it is important that grain is properly dried **before** quality is impaired. Milling specifications are likely to include specific (or bushel) weight and screenings in addition to moisture content, but in some markets kernel content and freedom from discoloured groats are very important. There is a developing market for PGR-free oats.

Specific weight is important in the marketing of grain; it is very dependent on growing conditions. High specific weight varieties are less likely to incur discounts or risk rejection.

REDUCING DISEASE RISK

(a) The most economic way of avoiding yield loss due to disease is to grow disease resistant varieties.

Disease ratings are calculated from assessments of disease in naturally infected trials throughout the UK and in inoculated tests. Ratings are UK ratings on a 1-9 scale, where 9 indicates good resistance and 1 poor resistance. A rating is an indicator of disease risk. It describes the likely severity of infection when conditions favour disease development and compatible races of the disease are present. Where conditions are less favourable to a particular disease, or compatible races are absent, a variety may appear more resistant than indicated by its rating. Occasionally, a variety may be less resistant than expected due to the emergence of a new race of disease which overcomes its resistance.

Varieties with a rating of 8 or 9 are sufficiently **resistant** that the disease is unlikely to reduce yield.

Varieties with ratings of 6 or 7 are **moderately resistant**. Disease may develop under favourable conditions, but yield is unlikely to be substantially reduced.

Varieties with ratings of 4 or 5 are **susceptible** and are likely to become severely infected under conditions favourable to the disease. Fungicides will probably be required.

Varieties with ratings of 1, 2 or 3 are **very susceptible** and are likely to become severely infected. Such varieties initiate epidemics. Routine fungicide treatment will be necessary.

Variety resistance can sometimes break down within season. This is most likely to happen where a variety relies on a single major gene for its resistance. If this occurs the rating may change from 9 (good resistance) to 4 or lower (susceptible). Winter barley varieties with *Rhynchosporium* resistance ratings of 6, 7 and 8 should be regarded as susceptible and those varieties with 5 or less are very susceptible. The presence of different *Rhynchosporium* populations in Scotland impacts on the susceptibility of winter barley varieties. Varieties of winter barley susceptible to mildew, yellow rust, brown rust, *Rhynchosporium,* net blotch

or *Ramularia* may act as sources of infection for spring barley crops. Fungicides applied in the spring to winter barley will reduce disease spread to spring barley. Spring barley varieties susceptible to the prevalent diseases will also need to be protected by fungicide seed treatment or sprays.

Septoria tritici is currently the most common disease of wheat. Recent issues concerning fungicide resistance to strobilurin (QoI) fungicides and triazole (DMI) fungicides mean that varietal resistance is becoming more important to manage this disease: Alchemy (rated 7) is the most resistant of the recommended varieties.

Septoria nodorum has declined as a significant disease of winter wheat, however it can still occur and may be overlooked as symptoms are less easy to identify than those of *Septoria tritici*. Consort, Cordiale and Solstice are the most susceptible recommended varieties to *Septoria nodorum* (resistance ratings 4 or 5).

(b) Diversification of varieties

Principles of variety diversification:
Overall levels of certain diseases, especially barley mildew and wheat yellow rust are increased if the more susceptible varieties are grown. The risk from these diseases is reduced if more than one variety of barley or wheat is sown, provided varieties which are to be grown in adjacent fields in the same year, or in the same field in successive years, or in a mixture, are not susceptible to the same races of the pathogens.

On the basis of information supplied by the UK Cereal Pathogen Virulence Survey, barley varieties have been grouped into Diversification Groups (DG) according to the races of mildew which attack them. Wheat varieties have been grouped according to the races of yellow rust to which they are susceptible as adult plants. These diversification groups are shown in the tables.

Winter wheat yellow rust:
Yellow rust is a serious threat to yield in certain varieties. The sudden appearance of new races on previously resistant varieties can occur and regular inspection of all varieties is important, irrespective of rating. This is particularly the case now that yellow rust has become a common problem in winter wheat.

The risk of spread of yellow rust is low where Alchemy, Cassius, Grafton, Istabraq, Solstice or Viscount are grown together or with any one other recommended variety and where Cordiale is grown with Consort or Einstein or Oakley or Robigus.

There is a high risk of spread from any other combination of recommended varieties. Robigus (resistance rating 2) and Consort (resistance rating 7) are both in Diversification Group 7; if yellow rust develops on Robigus, there is a high risk that it will spread to Consort.

Barley mildew:
Varieties in Diversification Group 0 (Accrue, Cassata, Pearl, Pelican, Retriever, Volume and spring varieties Forensic and Optic) do not contribute to the diversification of varieties to reduce the effect of mildew on the crop but note that DG0 varieties with high resistance ratings e.g. Pelican are effective at limiting the potential of an epidemic.

Varieties in Diversification Group 1 (Belgravia, Decanter, NFC Tipple, Publican, Quench, Riviera, Scout, Waggon, Westminster and the winter barley Amarena) are currently resistant to mildew and are good partners to all varieties.

Varieties in Diversification 4 (Cocktail), 10 (Boost, Saffron or Sequel) and 14 (Oxbridge or Rebecca) may be grown with Amarena or any of the other recommended spring varieties on the SAC list apart from those in the same DG.

EYESPOT AND SHARP EYESPOT

Recent research has developed a risk assessment for eyespot; it is available at www.sac.ac.uk/crops. High risk factors include wheat as the previous crop, ploughing compared to minimal tillage, early sowing, high spring rainfall and the presence of disease at GS31-32. Absence of disease at GS31-32, either visually or by diagnostic assessment, does not necessarily pose a low risk.

Sharp eyespot is less common, but when infection is severe, yield loss and lodging can occur. All varieties of wheat are susceptible to some degree.

SNOW ROT

Snow rot has receded as an important disease of winter barley but a move to short rotations, earlier sowing and minimum cultivations would encourage it. There is insufficient evidence to give susceptibility ratings. Consideration should be given to the protection of advanced lush crops especially where the previous crop was winter barley, snow is likely to lie or where crops are weakened by manganese deficiency.

SEED-BORNE DISEASES

Loose smut is a seed-borne disease found mainly on open-flowering barley varieties (most winter and spring varieties). Certified seed will have a guaranteed low incidence of loose smut but infection can build up rapidly in home-saved seed.

Leaf stripe became common in spring barley in 1990. Adoption of a voluntary standard for seed infection and the use of effective seed treatments have resulted in a significant reduction in its incidence; however, the disease remains a threat to spring barley.

Recent research has shown that *Rhynchosporium* and *Ramularia* can be seed-borne. *Rhynchosporium* on the seed can lead to widespread infections on winter barley in February.

Levels of *Microdochium nivale* on seed have been high in 2007 and 2008. There is evidence from France that this fungus is developing resistance to strobilurin fungicides.

Where loose smut or leaf stripe is found in a growing crop from which seed is to be taken, the seed should be tested for these diseases at the Official Seed Testing Station for Scotland, 1 Roddinglaw Road, Edinburgh EH12 9FJ.

It is recommended that all winter wheat seed is treated to protect against *Microdochium nivale* and Bunt.

BARLEY SPOTTING

Barley spotting has been common on several varieties in the last decade causing yield loss and high screenings. Spotting appears on the upper leaves at ear emergence; in extreme cases the top two leaves die. This damaging effect can be significantly reduced if protectant fungicides (e.g. triazoles, boscalid, chlorothalonil) are applied at the boot stage before ear emergence, but not all forms of spotting respond to fungicide treatment. These fungicides will improve green leaf area retention, but it is common for spots to appear late in the season in some varieties. Some fungicides (e.g. mildew eradicants) may even reduce green leaf area if applied late in the season under certain circumstances. Varieties have been categorised for their resistance to leaf spots (see thumbnail sketches) and also for green leaf area retention (see spring barley table).

In recent years, barley spots developed late in the season in winter barley causing early loss of green leaf area; this problem can be minimised with fungicides as used on spring barley. Of the recommended winter varieties, Cassata is the most susceptible to *Ramularia*, Pearl is the least affected.

BARLEY MILD MOSAIC VIRUS

This virus (BaMMV) and the close relative BaYMV are carried by a soil-borne fungus and can cause serious losses in winter barley. BaMMV is present on a small number of farms in Aberdeenshire and East Lothian. Use of resistant varieties is the only method of preventing the disease. The varieties on the SAC list that are resistant to the common strain are Boost, Cassata, Pelican, Retriever, Sequel and Volume.

ERGOT

Ergot can affect all cereals and it is common in seasons where the flowering period is extended by cool wet weather. It is becoming common: this is serious as some users have zero-tolerance at intake. Ergot triggers a critical control point in the SQC scheme requiring counter-measures. Ergot has been reported in a range of varieties. Maresi appears particularly vulnerable. In inoculated tests Cocktail, Decanter, Oxbridge, Riviera and Westminster showed symptoms. Triticale poses the highest risk, as do infertile secondary tillers. Grass-margins, grass weeds, set-aside and contaminated seed are potential sources of ergot.

ORANGE BLOSSOM MIDGE

Orange blossom midge was rare in Scotland but it has been seen in crops as far north as Tayside so growers should be alert to it in future. Robigus, Oakley and Viscount have genetic resistance to this pest; see the HGCA website or Recommended List for other resistant varieties.

VARIETY RESPONSE TO DISEASE CONTROL

All trials include treated plots assessed for yield. As only a few trials have untreated plots that are assessed for yield, the untreated yield column in the tables, has been changed to indicate the UK yield penalty where treatment is not provided.

The programmes of fungicides for barley and wheat are comprehensive; the intention is to keep all diseases to a minimal level throughout the growing season thus allowing maximum yield potential to be achieved. For spring barley the programme consists of a two or three-spray programme depending on mildew and *Rhynchosporium* pressure. For winter wheat it is a three or four-spray programme and for winter barley a three or five-spray programme depending on disease incidence or risk. For oats it is a two or three-spray programme.

SPRING BARLEY

IBD support for distilling and brewing

CONCERTO (Nickerson)

A new provisional recommendation. As a GN non-producer it has potential to meet the requirement for malt distilling: with a very high malt extract, it is well placed to progress towards IBD Approval for brewing. In similar trials, its grain nitrogen has been lower than Optic. Screening levels are low but not as low as Oxbridge. It is a relatively tall variety with average ratings for maturity, straw stiffness and brackling. Resistance to mildew is good but it is vulnerable to *Rhynchosporium* and *Ramularia* giving it a below average rating for green leaf area retention.

FORENSIC (Syngenta Seeds Ltd.)

A new provisional recommendation. As a GN non-producer it has potential for use in both malt and grain distilling; like Publican it has a micro-malting analysis comparable with varieties that have been used for brewing but is unlikely to progress through the IBD Approval tests for brewing. As a low accumulator of nitrogen, growers will need to manage the fertiliser inputs if a high nitrogen specification is required. Despite short straw, the 2008 results for lodging indicated relatively weak straw but this is based on relatively few sites and contains a significant element of inconsistency. Forensic shares the same rating as Optic for mildew as well as not contributing to diversification for mildew and it is almost as bad for *Rhynchosporium*. On current evidence it has yielded relatively better in North East Scotland

COCKTAIL (Syngenta Seeds Ltd.)
It has been moved to the outclassed category, reflecting its market share in Scotland. It has IBD Approval for both brewing and malt distilling with a malt extract slightly above Optic; it shares Optic's tendency to low nitrogen grain but in some years high screening losses limit its acceptance. Like Optic, it is classed by distillers as a low GN producer. It has been widely used for brewing and in 2008 still secured nearly 15% of the market share in England; in Scotland, distilling use is limited with a market share below 2%. It may have some export potential. It is slightly earlier than Optic with better resistance to brackling and ear loss. It is shorter than Optic, stiffer and has a profuse tillering habit that adds to the pressure on screenings in some years, especially if sown late. Resistance to mildew is rated 7; it may need protection with fungicide. It is potentially weak for yellow rust. In some years it is vulnerable to *Ramularia* with poor green leaf area retention. It has good BYDV resistance. It showed ergot symptoms in inoculated tests. It is well adapted to a range of situations with early sowing being preferable to limit screening losses.

OPTIC (Syngenta Seeds Ltd.)
IBD Approved for both brewing and malt distilling; it has markets across a wide band of nitrogen content as it is also recognised as an export variety. It is classed by distillers as a low GN producer. Its share of the Scottish malting market in 2008 was over 40% with signs that some maltsters are keen to source even more in 2009; in England it has met a steep decline with NFC Tipple and Quench set to dominate the brewing market. Its tendency to low nitrogen is attractive to distillers. Mildew resistance is poor especially at the seedling stage, it is now in Diversification Group 0: it is vulnerable to *Rhynchosporium* and *Ramularia* but is less affected by abiotic spotting. It is later than average but in recent years the trend has been to breed varieties of similar or even later maturity! Brackling can be a problem in a delayed harvest. It is a rather high tillering variety so high seed rates should be avoided; early sowing has benefits both in respect of yield and grain size. There is a slight yield advantage in favour of the heavier textured lower lying sites.

IBD support for distilling only
PUBLICAN (Syngenta Seeds Ltd.)
Recently promoted to a full recommendation and now carrying full IBD Approval for malt distilling; despite a micro-malting analysis comparable to some varieties used for brewing, it will not undergo formal IBD brewing tests but there is an expectation that some bulks will used for brewing. Like Optic, it is classed by distillers as a low GN producer, so it meets the current requirements. Despite high yield, protein levels remain slightly higher than Optic so growers should be cautious over nitrogen rates. Screening losses are low. It has good resistance ratings for mildew and *Rhynchosporium*, but low ratings for yellow and brown rust. It has good green leaf area retention and resistance to abiotic spotting. It is later than Optic. The straw is above average in length and has shown signs of weakness in some trials. It yields relatively better on lighter, lower potential soils.

BELGRAVIA (Nickerson)
Still a provisional recommendation, it has been granted IBD stage 1 Approval for malt distilling with the added bonus that it may qualify for grain distilling: it is a GN non-producer. Based also on micro-malting results, it failed to gain IBD stage 1 Approval for brewing. Relatively it

has a high grain nitrogen content. It rates well for disease resistance, including *Ramularia*, and has very good green leaf area retention: there is only a small yield penalty if untreated. Straw is tall and rather weak. There is tentative evidence that it is better adapted to low-ground, high yielding sites

OXBRIDGE (Nickerson)
Fully recommended with IBD Approval for malt distilling; as a non-producer of GN with a high spirit yield it has great potential and captured over 30% of the Scottish spring barley malting purchases in 2008. Some distillers have experienced processing problems so check with your buyer to ensure you have a market. In 2007 some bulks of this large grained variety were rejected for skinning and in 2008 some bulks, particularly in SE Scotland, suffered pre-germination rejections in a wet harvest. As a variety it now carries a degree of weather-related risk. Yield in some areas was disappointing in both 2007 and 2008. It has very low screening losses. With a low DP it is unlikely to be used for brewing or grain distilling so growers should concentrate on the lower part of the nitrogen spectrum. It is of interest for pearling. It is in DG14 for mildew, rated 7 and is likely to need protection; it has better than average *Rhynchosporium* resistance; it has moderate ratings for *Ramularia* resistance and abiotic spotting but poor for green leaf area retention. It is moderately vulnerable to yellow rust. It showed ergot symptoms in inoculated tests. It has stiff straw, good resistance to brackling and is a little earlier than Optic. It is better adapted to the heavier soils.

DECANTER (Nickerson)
IBD Approved for malt distilling, it is the only fully recommended variety suitable for grain distilling where there is an additional requirement for high grain nitrogen. It is a GN non-producer. It maintains its market share despite a relatively low yield so it will fade fast once replacement grain distilling varieties gain commercial recognition. Small grain size can result in high screening losses over the conventional 2.5mm screen; it is sometimes traded over a smaller screen. Husbandry measures, such as early sowing, reducing the seed rate and delaying the nitrogen top-dressing have a beneficial effect on screening levels. It has good ratings for ear and green leaf area retention and resistance to *Ramularia* and brackling. Mildew resistance is good. It showed ergot symptoms in inoculated tests.

TARTAN (Nickerson)
Based on micro-malting results Tartan has sufficient enzyme to be granted IBD stage 1 Approval for grain distilling. It has the potential to replace Decanter in this market with the benefit of much lower screening losses. In the field it has outyielded Decanter by a small amount, but insufficient to compete with other available higher yielding varieties in the malt distilling market. It has good resistance to mildew but is weak for *Rhynchosporium*. It is early, possibly as early as Riviera. Straw length is average but stiff with good resistance to brackling. Relative to Decanter, it yields better on the heavier soils.

IBD support for brewing only
QUENCH (Syngenta Seeds Ltd.)
A very high yielding full recommendation. It will not qualify for distilling support as it doesn't meet the requirement for limiting GN. In brewing terms it is progressing through the IBD system with some positive results: commercially there has been considerable brewing

interest in England with over 5% of the 2008 purchases. The straw is shorter than average but carries good resistance to brackling. *Rhynchosporium* resistance is above average but it is potentially vulnerable to both yellow and brown rust. Green leaf area retention is above average. Maturity is similar to Optic. It appears better adapted to high yielding low-ground sites and early sowing.

NFC TIPPLE (Syngenta Seeds Ltd.)
A high yielding recommendation with full IBD Approval for brewing; it captured nearly 60% of the English malting purchases of spring barley in 2008. It has potential in some export malt markets but is unlikely to be used for distilling as it doesn't meet the requirements for limiting GN. It has potential for pearling but acceptability is very dependent on the sample. It is rather short for a feed variety but the straw is stiff with good resistance to brackling; green leaf area retention is good. It has good resistance to mildew, brown rust, *Ramularia* and abiotic spotting but weak resistance to *Rhynchosporium* and it is potentially very weak for yellow rust. There are indications that it has done relatively better in SE Scotland and on high potential sites.

Feed varieties
SCOUT (Nickerson)
Provisonally recommended as a feed variety based on its high yield. Some of the other characters are less encouraging. Straw length is average with indications of weakness reappearing in 2008. It is later than Riviera and Waggon. *Rhynchosporium* resistance is poor and it is potentially very vulnerable to yellow rust. Mildew resistance and retention of green leaf area are both good and it is provisionally rated highly for BYDV resistance. It is better adapted to upland high yielding sites. It underperforms in SW Scotland.

WAGGON (Syngenta Seeds Ltd.)
A fully recommended, very high yielding feed variety. As in 2007, sample quality did not match the requirement for pearling. There are concerns about its very low rating for *Rhynchosporium* resistance especially in the West of Scotland where its infection levels are generally worse than Optic: in the East its infection levels have been lower and it has appeared to be more resistant. Its straw is of average length, stiff with a good rating for brackling resistance. It is earlier than Optic and similar to Riviera. Apart from *Rhynchosporium*, disease resistance is good and so is its green leaf area retention. It is provisionally rated highly for BYDV resistance. It maintains its yield over a range of situations.

REBECCA (Nordsaat, Germany/Saaten Union UK Ltd.)
Compared with Waggon, its yield is becoming outclassed: in some 2008 trials its tall straw lodged badly giving rise to a fall in its stiffness rating, it is also vulnerable to brackling. Mildew has become a problem in recent years; downgraded to 6, it was reclassified to DG14 as it is vulnerable to the same mildew race as Oxbridge. *Rhynchosporium* resistance is above average. It is potentially vulnerable to yellow rust. It is provisionally rated poorly for BYDV resistance. Maturity is average. It is rated good for retention of green leaf area and has shown relatively low levels of *Ramularia*.

WESTMINSTER (Nickerson)
Although it carries IBD Approval for brewing in England, no Scottish purchases were reported in 2008. Its main use in Scotland is as a tall feed variety with good disease resistance to both mildew and *Rhynchosporium,* and good green leaf area retention: it is also rated highly for resistance to abiotic spotting. These resistances may contribute to its late maturity. It showed ergot symptoms in inoculated tests. It has potential for whole-crop. It maintains its yield over a range of conditions with a slight bias towards upland sites.

RIVIERA (RAGT Seeds Ltd.)
A rather erratic feed variety that continues to yield well in the West, elsewhere it is outclassed. Sometimes it is acceptable for pearling. It is early, tall and likely to need stiffening. It has only moderate resistance to *Rhynchosporium*. It showed ergot symptoms in inoculated tests. It is readily infected with BYDV.

WINTER BARLEY

IBD Approval for brewing
CASSATA (Nickerson)
Newly added to the SAC list, it carries IBD Approval for brewing and following commercial purchases in 2007 and 2008, there is strong support for the variety from the only Scottish maltster who currently sources winter barley. It also has some potential for pearling. It provides an alternative to Pearl with advantages in stiffer straw, lower risk of dormancy and resistance to BaMMV. Compared with Pearl, it is weaker for mildew and very vulnerable to yellow rust. The provisional data suggest it is relatively stable across soil types and it yields relatively better than Pearl on high yielding sites

PEARL (Nickerson)
Carries IBD Approval for brewing; Pearl is the dominant malting winter barley variety with over 60% of the UK market. There is some Scottish malting interest in Pearl but growers should note that dormancy limits its use. It is the tallest recommended two-row variety, with rather weak straw if not grown with a malting specification in mind. It ripens late. It is susceptible to winter-kill and net blotch. Pearl no longer contributes to mildew diversification; it is susceptible at the seedling stage but has good adult plant resistance. It is sometimes used in blends to improve the specific weight of some of the six-row varieties. It is more likely to outyield Cassata on the less fertile sites and appears to suit intermediate soil types especially where a cereal was the previous crop.

Six-row feed varieties
VOLUME (Syngenta Seeds Ltd.)
This new provisional recommendation is a hybrid six-row with a very high yield and an encouraging specific weight. It is tall and has produced some evidence of weak straw: with such yield potential, a robust growth regulator programme is advisable. Other than for *Rhynchosporium* and net blotch, foliar disease resistance is mediocre rather than good; green leaf area retention is good and resistance to *Ramularia* is above average. It has resistance to BaMMV.

PELICAN (Saaten Union, Germany/Saaten Union UK Ltd)
This fully recommended six-row variety has a low specific weight, similar to Amarena. It is very high yielding. The straw is tall; it isn't as early maturing as the other six-row varieties. It is vulnerable to net blotch and *Ramularia* but still supports a high untreated yield and has good green leaf area retention. It has resistance to BaMMV. Yield performance has been relatively better in SE Scotland especially when early sown.

BOOST (Syngenta Seeds Ltd.)
This fully recommended six-row variety is a hybrid. It looks suitable for pearling providing the colour isn't too yellow. It has a high specific weight, almost comparable with Sequel and much lower screening losses. Compared with Sequel, it has similar or better resistance to all foliar diseases, other than for brown rust, and it is much stiffer. It has resistance to BaMMV and looks slightly better than average for winter-hardiness. It has average vulnerability to *Ramularia*. Yield performance has been relatively better in NE than SE Scotland and it is better adapted to the higher yielding sites. Avoid later sowing.

AMARENA (Nordsaat, Germany /Saaten Union UK Ltd.)
This six-row variety has a low specific weight and it is now looking outclassed compared with Pelican. It is stiff. It has a high untreated yield; mildew resistance is exceptionally good, yellow rust is a weaknesses. It does not have BaMMV resistance. It has moderately good winter-hardiness. Green leaf area retention is very good. Avoid later sowing. It is better adapted to the higher yielding sites. It does relatively better in NE Scotland and has been disappointing in England and in the West of Scotland.

SEQUEL (Syngenta Seeds Ltd.)
This fully recommended six-row variety retains its place because of its high specific weight; screening losses are rather high. Bold samples may be accepted for pearling. It is early, with rather tall weak straw, is resistant to BaMMV, but resistance to brown rust and *Ramularia* is only moderate. Heavy soils should be avoided. It yields relatively better in NE Scotland.

Two-row feed varieties
RETRIEVER (Sejet, Denmark/Nickerson)
This full recommendation is a two-row feed variety, it has produced outstanding yields that seriously challenge the six-row varieties. In some trials Retriever has looked disappointing but still produced excellent yields. Specific weight is rather low and screening levels are high compared with other recommended two-row varieties. It may have some potential for pearling provided the colour isn't too yellow. Although it is relatively short, it has weak straw and a good stiffening response to pgr. Its high figure for yield loss if untreated reflects vulnerability to mildew, *Ramularia* and lodging and it has a poor record for green leaf area retention indicating a need for sound protection. It tends to yield relatively better on low potential sites after cereals, light soils and especially in NE Scotland.

ACCRUE (Saatzucht Ackerman, Germany/Saaten Union UK Ltd.)
This two-row feed variety is a full recommendation, slightly higher yielding than Saffron: it is nearly as stiff and much better for both mildew and *Rhynchosporium,* giving it a high untreated yield. It is better adapted to lighter textured and lower yielding sites than Saffron.

SAFFRON (KWS UK Ltd.)
This fully recommended two-row feed variety has not yielded quite as well in Scotland: it is useful as a short and stiff variety. It has good resistance to net blotch and *Ramularia* but is very weak for mildew and *Rhynchosporium*. It is better adapted to high potential heavier textured sites than Accrue.

WHEAT

Soft textured varieties are preferred by the distilling industry
VISCOUNT (KWS UK Ltd.)
This new provisional recommendation has been rated good for distilling; as a nabim Group 4 variety, it is unlikely to be used for biscuit-making in Scotland, but is listed for export as a **uks** variety. Specific weight and Hagberg Falling Number are close to Robigus. Care may be needed in a wet harvest as there are indications that it is at risk from sprouting. With a good untreated yield, it has no significant disease weaknesses. It is resistant to orange blossom midge. Straw stiffness is similar to Robigus, both varieties have a relatively small response to pgr.

CASSIUS (Nickerson)
This new provisional recommendation has been rated medium for distilling; as a nabim Group 4 variety, it is unlikely to be used for biscuit-making in Scotland, but is listed for export as a **uks** variety. Specific weight and Hagberg Falling Number are low, below the other listed distilling wheats. With a good untreated yield, it has no significant disease weaknesses. Straw stiffness is similar to Robigus and it has a better response to pgr.

ISTABRAQ (Nickerson)
Fully recommended with a good rating for distilling. As a nabim Group 4 variety, it is unlikely to be used for biscuit-making in Scotland, but is listed for export as a **uks** variety. It has a high specific weight. The straw is tall and rather weak but it responds well to pgr. It has above average resistance to eyespot and *Fusarium* ear blight but vulnerability to *Septoria tritici* and especially mildew give it an above average response to fungicide. It doesn't suit early sowing due to weak straw and relatively fast speed of development. It has a relatively low vernalisation requirement. Relative to SE Scotland, it underperforms in the North East. It also underperforms on high yielding sites. Of the recommended distilling wheats, it yields relatively well when grown as a second cereal.

ALCHEMY (Nickerson)
A full recommendation, rated medium for distilling. Placed in nabim Group 4, it is unlikely to be used for biscuit-making in Scotland, but it has potential for export as a **uks** blending variety: it does not suit some export buyers as a pure variety. By soft wheat standards it is high for both specific weight and Hagberg and its sprouting resistance is similar to Consort, better than Robigus and Istabraq. Its excellent untreated yield reflects good resistance to the normal foliar disease threats in Scotland: the brown rust infections of 2007 indicate a weakness that may appear again. The straw is a bit stiffer than its seven rating implies, especially where pgr is applied. Speed of development is slow so late sowing conditions should be avoided. It performs relatively better if sown after a break crop and in high potential situations.

ROBIGUS (KWS UK Ltd.)
Fully recommended, this soft wheat is graded medium for distilling and is suitable for biscuit-making; it is also listed as a **uks** variety for export. It is a small grained variety so should be sown by seed number. It is rated rather weak for sprouting. Straw strength is a little weaker than Consort with a disappointing response to pgr. It can no longer be regarded as a low input variety. It is in the same group as Consort for yellow rust but much more susceptible and in recent years has needed almost routine protection. During 2005 mildew appeared on Robigus; recent evidence has again downgraded its rating, to five. Likewise its *Septoria tritici* rating has also been downgraded. Eyespot resistance is also rather weak. It has resistance to orange blossom midge. It has a relatively low vernalisation requirement. Robigus is very high yielding in first cereal situations especially on high potential sites but its yield can be severely affected where it follows a cereal in the rotation.

CONSORT (RAGT Seeds Ltd.)
Seed availability, cost of disease control and yield are now making Consort look outclassed. This soft wheat is graded medium for distilling: it is readily used for biscuit flour and has characteristics that combined with high protein are needed for certain types of biscuit. It is listed as a **uks** variety for export. It is highly susceptible to *Septoria tritici* and *nodorum* and may need protection against yellow rust if grown near the highly susceptible Robigus. It is potentially weak for brown rust. It is late ripening and has stiff straw. Against Robigus it is competitive in second cereal situations. With stiff straw and a slow speed of development it can be sown early.

The other recommended varieties
OAKLEY (KWS UK Ltd.)
This full recommendation has produced some very high yields: it is a hard endosperm nabim Group 4 wheat so there is little prospect of use for distilling or milling. It has a low specific weight and Hagberg Falling Number. As a high yielding variety, it needs and responds well to pgr. It carries low ratings for mildew, *Septoria tritici*, eyespot and *Fusarium* resistance. It should be treated as a high input variety. It has useful resistance to wheat orange blossom midge and produced some very impressive yields in 2007. It is a relatively slow developer but weak straw and susceptibility to eyespot mean it does not suit early sowing. Yield performance is relatively disappointing when sown after a cereal. It has yielded relatively well on lighter textured, high potential sites and in NE Scotland.

GRAFTON (KWS UK Ltd.)
A new provisional UK special recommendation based on its earliness and ability to spread harvest. It a hard endosperm nabim Group 4 wheat so there is little prospect of use for distilling or milling. Compared with Oakley, it has a high specific weight and Hagberg Falling Number: it is very early and exceptionally stiff with very good eyespot resistance. Resistance to *Fusarium* and brown rust are provisionally rated poor. It could be a robust low-input variety for whole-crop especially as its yield is relatively higher in the wetter West.

EINSTEIN (Nickerson)
This fully recommended hard endosperm variety is at the low end of nabim Group 2 for bread-making. It is widely used by some UK domestic millers and it has export use as a

ukp variety with Chopin figures that readily match the requirement for blended flour. High yielding varieties of this type need special attention to nitrogen management if the protein specification is to be achieved. Specific weight and Hagberg are moderately high but not as high as Cordiale. Lodging, especially early root lodging in recent seasons has downgraded its rating to a disappointing six; pgr is needed and it benefits with a large response. It has moderate all round disease resistance with *Septoria tritici* resistance tending to the weak. Its fast speed of development makes it better suited to later sowing. It does well as a second cereal with a bias in favour of lighter soils and lower yield potential sites.

CORDIALE (KWS UK Ltd.)
This recommended bread-making variety is in nabim Group 2. It is used by some UK millers and may be preferred earning a premium over other Group 2 varieties. It is listed as a **ukp** variety for export with good Chopin figures. Both specific weight and Hagberg are very high. In Scottish trial sites in 2007, it recorded very high levels of grain infertility: there were also reports of yield being seriously affected in some commercial crops especially where it was sown early or in conditions likely to produce forward crops – it is a relatively fast developer so more vulnerable when sown early or in North East Scotland. It is early maturing with stiff straw, stiffer than Consort. It justifies a robust fungicide programme. It is potentially vulnerable to brown rust. It provides a useful choice as a second cereal.

SOLSTICE (Nickerson)
Regraded to nabim Group 1 it is the main quality bread-making variety. This **ukp** variety can also be sold into export markets. Specific weight and Hagberg are moderately high but not as high as Cordiale. It has good resistance to sprouting. It is weak for mildew and brown rust. Although it is a slow developing variety, vulnerability to eyespot limits its use for early sowing.

Winter varieties require vernalisation (some cold weather); this requirement limits their use for spring sowing. The latest safe sowing date in Scotland is likely to be at the end of February with varieties such as Istabraq and Robigus at the safer end of the spectrum. Spring varieties develop without needing vernalisation, they can be sown later in the spring but this leads to an even later harvest. The table lists UK data for available recommended quality varieties.

TYBALT (Wiersum, Netherlands/Nickerson)
A nabim Group 2 recommendation with a very impressive yield. Growers should note a possible low rating for straw strength. With such high yields and a protein 1.4% below Paragon, additional nitrogen is required to meet protein specifications. The specific weight also risks being below the marketing standard. Failure to meet protein and specific weight specifications is a common cause of rejection for milling.

ASHBY (KWS UK Ltd.)
A nabim Group 2 variety with no significant agronomic weaknesses but outclassed by Tybalt's large spring-sown yield.

PARAGON (RAGT Seeds Ltd.)
The only fully recommended nabim Group 1 spring variety. As a late autumn sown variety it is 10% lower yielding than Solstice; in spring it is 15% below Tybalt. It has no significant agronomic weaknesses.

SPRING OATS

HUSKY (Nordsaat, Germany/Saaten Union UK Ltd)
A provisional recommendation but needs more evidence before Scottish growers and millers are likely to support it commercially; encouraging Scottish yields in 2007 were followed by disappointment in 2008. Early maturity and relatively stiff straw with good mildew resistance look promising. It is a little above Firth in specific weight and a little below for kernel content.

ATEGO (Selgen, Czech Republic/Trevor Cope Seeds Ltd.)
A recommendation that needs very careful protection against mildew if its yield potential is to be achieved. Although kernel content and specific weight are low, one miller has expressed interest. Its maturity and short straw could be useful. Scottish yields in the last three years have been unexciting: together with its agronomic and quality weaknesses it has difficulty supplanting Firth.

FIRTH (Lochow-Petkus, Germany/KWS UK Ltd.)
Recommended for its reliability, agronomic characters and quality. This combination has created a dominant and strengthening position at 55% of the 2008 UK seed area (75% in Scotland). For millers it has a combination of good kernel content, low screenings and moderate specific weight; they also value its reliability and speed through the mill. In 2001 it showed a tendency to free-shell; reducing the drum speed should alleviate this problem if it reoccurs.

DRUMMER (Lochow-Petkus, Germany/Nickerson)
Becoming outclassed with only 1% of the 2008 UK seed market (3% in Scotland). Milling support is limited with comments about variable milling yield and a rather mixed groat size. Straw is tall, weak and needs stiffening.

LEVEN (Lochow-Petkus, Germany/KWS UK Ltd.)
This provisional recommendation has a high kernel content that attracts milling interest. It is stiff, early and has good mildew resistance but yield potential looks rather limited; it could have potential in organic and conservation grade systems where its yield will be more competitive. Its Scottish yields show a similar deficit against Firth and there aren't any reports of commercial milling experience to confirm its milling quality.

WINTER OATS

Winter oats are widely grown. Earliness and yield relative to spring oats are major benefits. There is a substantial milling market for winter oats in Scotland: some of this must be pgr-free. Achieving pgr-free winter oats is likely to be more challenging than achieving pgr-free

spring oats. As winter oats are less hardy than winter wheat and winter barley, they should be sown early to reduce the risk of winter-kill and plant heave. The yields given in the table are UK yields.

TARDIS (IGER, Aberystwyth/Senova Ltd.)
Like other varieties this provisional recommendation has produced very variable yields in Scotland: it yielded well in the 2008 Scottish site, in the absence of pgr. It is unlikely to become popular with millers as its kernel content is only equivalent to Gerald and the specific weight is much lower. It benefits from stiff straw and excellent mildew resistance.

SW DALGUISE (Senova Ltd.)
Yield in Scotland has been very variable with excellent yields in 2002 and 2004 but relatively disappointing in the last four years. On some sites lodging has reached very high levels, indicating high risk if pgr is omitted. It is early ripening. It has milling support with good colour, size and specific weight but recent milling yields have been a bit variable with unexpectedly high groat breakage. Crown rust and mildew resistance are poor.

MASCANI (IGER, Aberystwyth/Senova Ltd.)
A recommendation for its very high milling potential, based on an excellent kernel content, high specific weight and low screenings; recent observations also indicate it is relatively free of discoloration. Yields are disappointing especially in Scotland where Gerald out-yields it by more than 5%. It is relatively stiff and yields well in pgr-free trials. It has relatively good resistance to mildew but could be affected by crown rust.

GERALD (IGER, Aberystwyth/Senova Ltd.)
Popular with growers and acceptable to millers despite a low kernel content. It maintains its yield rather better in Scotland than SW Dalguise and Mascani especially in the absence of pgr and has been less variable than those two varieties. Mildew resistance is weak.

NAKED OATS

Naked oats yield below 80% of the conventional varieties but they have the potential to earn a premium and should be grown on contract. The terms of the contract have an important bearing on the profitability of the crop. Naked oats should be regarded with some caution as they must not be harvested before fully mature and particular care is needed in drying and handling this crop. Information on naked varieties may be obtained from the HGCA website. There is a market for naked oats in the poultry industry.

SPECIAL RECOMMENDATIONS FOR THE WEST

A few varieties perform rather better or worse in the wetter conditions of the west than in the drier east, these are highlighted in this section:

Spring barley:
Riviera continues to produce competitive yields in SW Scotland; Westminster also yields

well and looks useful for whole-crop. Waggon is early and has produced excellent yields with stiff straw but a severe risk of *Rhynchosporium* infection if unprotected. Publican is high yielding with much better *Rhynchosporium* resistance than Waggon but not such stiff straw and not as early. NFC Tipple, Oxbridge, Optic, Rebecca and Scout have underperformed.

Winter barley:
Of the six-rows Sequel has done relatively better in the West: for those who can cope with a low specific weight, high yielding Pelican is a good choice. Amarena should be avoided. The stiff two-row varieties Saffron and Accrue have done relatively well, maintaining their yield but not outyielding the weaker strawed Retriever.

Winter wheat:
For distilling, Istabraq and Alchemy have yielded well: Robigus is penalised as it is a disappointing second cereal. Consort under-performs. For bread-making, Solstice yields well in the West. Cordiale matches Einstein's yield and has the advantage of being earlier and stiffer. For feed, Oakley has the highest yield on the SAC recommended list but with a low untreated yield and weak straw. JB Diego, recommended by CEL, is another hard endosperm variety, with the benefit of high yield in the West and much stiffer straw: see also Grafton, below. For whole-crop, in the absence of yellow rust, Robigus yields well providing it follows a break crop. If following a cereal, Istabraq is worth considering but watch its vulnerability to lodging and mildew. Alchemy looks promising. Grafton also looks good, it has a high untreated yield, very stiff straw, excellent eyespot resistance and is early: vulnerability to brown rust and *Fusarium* are irrelevant in this context.

For further information consult your local SAC Advisory Office.

SAC Cereal Specialists may be contacted at:

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SAC RECOMMENDED CEREALS 2009

Year First Listed			Grain yield as a % of fungicide treated controls	Yield loss if untreated %	Use B=brewing D=distilling GD=grain distilling	Malting Approval†	Screenings <2.5 mm %	Specific weight kg/hl	Resistance to ear loss 1-9 poor-good	Maturity days +later -earlier than average	Straw strength 1-9 weak-strong	Straw length cm	Brackling risk 1-9 high-low	Disease 1 = susceptible 9 = resistant Mildew	Disease 1 = susceptible 9 = resistant Rhyncho-sporium	Green leaf area retention 1 = poor 9 = good	Diversific-ation group‡
SPRING BARLEY (100=7.3 t/ha, 58 cwt/acre)																	
2005	R	Waggon	107	14	Feed	No	6.9	66.5	8	-1	8	73	8	9	3	7	1
2007	R	Quench	105	13	B	(*2)	6.7	66.6	7	+1	7	70	8	9	8	7	1
2007	R	Publican	103	10	D & (B)	*D	4.8	67.8	6	+2	7	74	7	8	8	7	1
2005	R	NFC Tipple	103	13	B	*	5.9	67.4	8	0	8	69	8	8	4	6	1
2004	R	Rebecca	102	16	Feed	No	7.0	65.3	7	0	5	79	4	6	8	7	14
2003	O	Cocktail	101	14	B & D	*	8.6	68.7	8	0	8	69	9	7	6	6	4
2005	R	Westminster	101	9	Feed	No	5.4	68.9	7	+1	6	81	6	9	8	7	1
2005	R	Oxbridge	98	12	D	*	4.4	68.5	7	0	8	73	8	7	7	5	14
1995	O	Riviera	97	10	Feed	No	4.8	69.3	6	-1	6	78	7	8	5	5	1
1995	R	Optic	96	17	B & D	*	7.5	68.8	6	+1	8	75	5	5	4	5	0
1999	R	Decanter	94	10	D & GD	*	8.3	68.2	8	0	8	74	8	9	6	7	1
2008	P2	Scout	107	13	Feed	No	6.1	67.4	8	0	6	71	8	8	5	7	1
2009	P1	Concerto	104	14	B & D	-	5.1	67.2	(8)	0	7	77	7	9	4	5	1
2009	P1	Forensic	102	17	B, D & GD	-	5.8	66.1	(7)	0	6	71	8	5	5	4	0
2008	P2	Belgravia	101	9	D & GD	(*1)	6.5	67.5	8	+1	7	76	7	9	7	8	1

WINTER BARLEY (100 = 9.0 t/ha, 72 cwt/acre)					Suitability light soils 1-9 poor-good								BaMMV R=resistant	Mildew	Rhyncho-sporium	Net Blotch	Diversific-ation Group‡
2007	R	Retriever	110	25	7	No	18.0	66.1	8	0	7	85	R	5	8	7	0
2007	R	Pelican	110	18	7	No	14.7	63.6	7	0	7	105	R	7	8	6	0
2006	O	Boost	107	21	7	No	9.0	68.6	7	-2	7	102	R	7	8	8	10
2005	O	Amarena	106	15	7	No	13.2	63.9	7	-1	7	103		8	8	7	1
2003	R	Sequel	103	19	8	No	18.2	69.2	7	-1	6	106	R	5	8	7	10
2007	R	Accrue	103	18	7	No	14.7	69.5	7	0	8	88		6	8	8	0
2005	R	Saffron	101	20	6	No	7.9	69.9	8	+1	8	89		3	6	8	10
1999	R	Pearl	97	18	5	*B	6.2	70.2	7	+1	7	99		6	7	5	0
2009	P1	Volume	116	19	8	No	16.1	68.5	(8)	-1	6	104	R	5	8	8	0
2009	P1	Cassata	98	19	6	*B	8.0	68.4	(8)	+1	8	89	R	4	8	5	0

WINTER WHEAT (100 = 10.4 t/ha, 83 cwt/acre)					Suitability as 2nd cereal 1-9 poor-good	Quality Markets: Distilling	Biscuit	Bread	Specific weight kg/hl	Hagberg falling number	Maturity days	Straw strength 1-9	Straw length cm	Resistance to sprouting 1-9	Mildew	Yellow rust	Septoria nodorum	Septoria tritici	Diversific-ation Group‡
2007	R	Oakley	108	23	4	Poor	Poor	Poor	75.2	160	0	7	87	5	5	6	7	5	10
2004	R	Istabraq	103	22	6	Good	Poor	Poor	77.8	196	+1	6	96	5	5	9	7	5	1
2006	R	Alchemy	103	16	4	Medium	Poor	Poor	76.9	240	+1	7	94	6	7	9	7	7	1
2003	R	Robigus	102	24	2	Medium	Good	Poor	76.1	197	+1	7	90	5	6	2	6	6	7
2003	R	Einstein	102	19	7	Poor	Poor	Medium	76.9	256	-1	6	88	6	6	7	6	5	10
1995	O	Consort	100	31	6	Medium	Good	Poor	76.2	218	+1	8	87	6	6	7	4	4	7
2004	S	Cordiale	99	24	6	Poor	Poor	Medium	79.0	293	-3	8	82	6	6	8	5	5	4
2002	S	Solstice	97	21	6	Poor	Poor	Good	77.6	263	0	8	96	7	5	9	5	5	1
2009	P1	Viscount	107	18	4	Good	Poor	Poor	75.8	185	+1	7	84	(4)	6	8	8	6	1
2009	P1	Cassius	106	18	6	Medium	Poor	Poor	74.4	168	0	7	87	(5)	6	9	8	6	1
2009	P1	Grafton	103	17	7	Poor	Poor	Poor	78.1	278	-3	9	79	(6)	6	8	6	6	1

Colour code: Good | Tends to be good | Intermediate | Tends to be poor | Poor

R = Recommended for general use

S = Specific use variety

P = Provisional

O = No longer in trial, becoming outclassed

‡ Disease risk can be reduced - see notes on pages 3 and 4

- Insufficient information

( ) Provisional ratings

† As assessed by the Malting Barley Committee

* Approved as a malting variety

(*1) Provisionally Approved as a malting variety

NB See variety description for TARTAN spring barley

The full data collected and the HGCA Recommended Lists are available on the HGCA website (www.hgca.com)

SPRING OATS (100 = 7.0 t/ha, 56 cwt/acre)

			UK Grain yield as a % of fungi-cide treated controls	Yield loss if untreated %	% Kernel content	Screenings %<2.0mm	Specific weight kg/hl	Maturity days + later -earlier than aver-age	Straw strength 1-9 weak-strong	Straw length cm	Crown Rust 1-9	Mildew 1-9
2007	R	Atego	99	19	73.5	0.1	53.1	-1	6	109	6	4
2000	R	Firth	98	10	76.5	0.2	54.0	+1	6	109	5	8
1997	O	Drummer	94	11	73.4	0.3	54.4	+1	5	119	5	7
2008	P2	Husky	100	12	75.2	-	54.6	-2	7	115	4	8
2007	P3	Leven	94	9	77.6	0	54.1	-1	8	110	5	8

WINTER OATS (100 = 8.2 t/ha, 65 cwt/acre)

2003	R	SW Dalguise	101	18	75.7	0.2	54.7	-1	5	123	3	3
2004	R	Mascani	100	7	78.1	0.1	54.6	0	6	119	8	6
1999	R	Gerald	99	15	72.6	0.2	53.5	+2	6	120	4	4
2007	P2	Tardis	105	12	72.9	0	50.2	-1	7	113	7	9

SPRING WHEAT (100 = 7.4 t/ha, 59 cwt/acre)					nabim Group	Hagberg falling number	Specific weight	Maturity days	Straw strength 1-9	Straw length cm	S. tritici	Mildew
2003	R	Tybalt	107		2	279	74.9	0	(3)	84	6	9
2001	R	Ashby	101		2	285	76.9	+1	7	87	5	7
1999	S	Paragon	92		1	274	75.5	0	6	93	6	7

Colour code | Good | Tends to be good | Intermediate | Tends to be poor | Poor

R = Recommended for general use

S = Specific use variety

P = Provisional

O = Becoming outclassed

The full data collected and the HGCA Recommended Lists are available on the HGCA website (www.hgca.com)